

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Application of: Niino <i>et al.</i>	Group Art Unit: To be assigned
Serial No.: To be assigned	Examiner: To be assigned
Filed: March 29, 2001	Attorney Docket No.: 5868-024
For: POLYACETAL BLOCK COPOLYMER	New York, NY March 29, 2001

**PRELIMINARY AMENDMENT**

Commissioner for Patents  
Washington, D.C. 20231

Sir:

Applicants request entry of the following amendments prior to calculation of the filing fee and examination of the above-identified application.

**IN THE CLAIMS:**

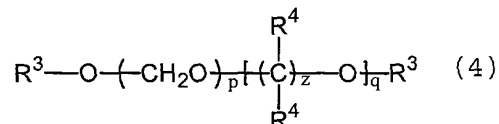
Marked up version of all revised claims, showing insertions and deletions, are included herewith in Appendix A. For examiner's convenience, a complete set of pending claims is attached herewith in Appendix B.

Rewrite claims 2-8 and 10-14 as follows:

2. (amended) The ABA block copolymer according to Claim 1, wherein B' is a hydrogenated polybutadiene containing 80-95 mol.% of 1,2-bonds and 5-20 mol.% of 1,4-bonds.

3. (amended) A polyacetal resin composition, which comprises 100 parts by weight of a polymer compound (I) comprising 20-100 wt.% of the ABA type block copolymer according to Claim 1 and 0-80 wt.% of a polyacetal copolymer having a

number average molecular weight of 10,000-500,000, represented by the following formula (4):



(where  $R^3$  and  $R^4$  are independently selected from the group consisting of hydrogen, an alkyl group, a substituted alkyl group, an aryl group and a substituted aryl group,  $p = 95 - 99.9$  mol.%,  $q = 0.1 - 5$  mol.%,  $p + q = 100$  mol.%, and  $z$  is an integer selected from 2 to 6), and 0.1 to 200 parts by weight of at least one of polymer compounds (II) having a number average molecular weight of 500 or more, selected from the group consisting of a polyolefin-based polymer compound, a polyurethane-based polymer compound, a polyester-based polymer compound, a polystyrene-based polymer compound, a polyacryl-based polymer compound and a polyamide-based polymer compound.

4. (amended) The polyacetal resin composition according to Claim 3, wherein the polymer compound (II) is a polyolefin-based polymer compound comprising  $\alpha$ -olefin-based polymer compound.

5. (amended) The polyacetal resin composition according to Claim 4, wherein the  $\alpha$ -olefin-based polymer compound comprises 0.1 to 6 parts by weight of an ethylene- $\alpha$ -olefin random copolymer having a number average molecular weight of 500-10,000, comprising 10-70 mol.% of ethylene units and 30-90 mol.% of  $\alpha$ -olefin units.

6. (amended) The polyacetal resin composition according to Claim 4, wherein the  $\alpha$ -olefin-based polymer compound is an  $\alpha$ -olefin-based copolymer modified by an unsaturated carboxylic acid or its acid anhydride.

7. (amended) The polyacetal resin composition according to Claim 3, wherein the polymer compound (II) is a polystyrene-based polymer compound comprising a copolymer of an aromatic vinyl monomer and a copolymerizable unsaturated monomer that can be copolymerized with the aromatic vinyl monomer.

8. (amended) The polyacetal resin composition according to Claim 3, wherein the polymer compound (II) is a polystyrene-based polymer compound comprising a block (a) comprising a styrene monomer and a block (b) comprising isoprene or isoprene-butadiene and containing 20 mol.% or more of vinyl bonds.

11. (amended) The polyacetal resin composition according to Claim 3, further comprising 0.01 to 0.2 parts by weight of at least two of difatty acid calciums having 12-22 carbon atoms.

12. (amended) A molding comprising an ABA type block copolymer according to Claim 1.

13. (amended) The molding according to Claim 12, wherein the molding is a large-diameter gear having a pitch circle diameter of 60 mm or more.

14. (amended) The molding according to Claim 12, wherein the molding is a large-diameter gear having a pitch circle diameter of 100 mm or more.

Add new claims 15-18 as follows:

- -15. (new) The polyacetal resin composition according to Claim 3, further comprising 0.01 to 0.9 parts by weight of at least two of esters of a fatty acid having 12-22 carbon atoms with ethylene glycol. - -

- -16. (new) A molding comprising a resin composition according to Claim 3. - -

- - 17. (new) The molding according to Claim 16, wherein the molding is a large-diameter gear having a pitch circle diameter of 60 mm or more. - -

- - 18. (new) The molding according to Claim 16, wherein the molding is a large-diameter gear having a pitch circle diameter of 100 mm or more. - -

## **REMARKS**

Claims 1-18 are in the case. Claims 2-8 and 10-14 have been amended. New claims 15-18 have been added.

All amendments are generally supported. Specifically, support can be found at the claims filed at the PCT stage. No new matter has been added.

The estimated filing fee of \$710 is believed to be due for this submission. Duplicate copy of the fee sheet is enclosed herewith. Should any fee(s) be required, please charge such fee(s) to Deposit Account No. 16-1150.

Respectfully submitted,

Date March 29, 2001



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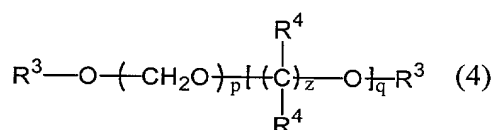
Enclosures

**Marked up Version of Claims Amended, March 29, 2001:**

(with insertion and deletion indicated in boldfaced underlining and brackets, respectively)

2. (amended) **The [An]** ABA block copolymer according to Claim 1, wherein B' is a hydrogenated polybutadiene containing 80-95 mol.% of 1,2-bonds and 5-20 mol.% of 1,4-bonds.

3. (amended) A polyacetal resin composition, which comprises 100 parts by weight of a polymer compound (I) comprising 20-100 wt.% of the ABA type block copolymer according to Claim 1 **[or 2]** and 0-80 wt.% of a polyacetal copolymer having a number average molecular weight of 10,000-500,000, represented by the following formula (4):



(where R<sup>3</sup> and R<sup>4</sup> are independently selected from the group consisting of hydrogen, an alkyl group, a substituted alkyl group, an aryl group and a substituted aryl group, p = 95 - 99.9 mol.%, q = 0.1 - 5 mol.%, p + q = 100 mol.%, and z is an integer selected from 2 to 6), and 0.1 to 200 parts by weight of at least one of polymer compounds (II) having a number average molecular weight of 500 or more, selected from the group consisting of a polyolefin-based polymer compound, a polyurethane-based polymer compound, a polyester-based polymer compound, a polystyrene-based polymer compound, a polyacryl-based polymer compound and a polyamide-based polymer compound.

4. (amended) **The [A]** polyacetal resin composition according to Claim 3, wherein the polymer compound (II) is a polyolefin-based polymer compound comprising α-olefin-based polymer compound.

5. (amended)        **The [A]** polyacetal resin composition according to Claim 4, wherein the  $\alpha$ -olefin-based polymer compound comprises 0.1 to 6 parts by weight of an ethylene- $\alpha$ -olefin random copolymer having a number average molecular weight of 500-10,000, comprising 10-70 mol.% of ethylene units and 30-90 mol.% of  $\alpha$ -olefin units.

6. (amended)        **The [A]** polyacetal resin composition according to Claim 4, wherein the  $\alpha$ -olefin-based polymer compound is an  $\alpha$ -olefin-based copolymer modified by an unsaturated carboxylic acid or its acid anhydride.

7. (amended)        **The [A]** polyacetal resin composition according to Claim 3, wherein the polymer compound (II) is a polystyrene-based polymer compound comprising a copolymer of an aromatic vinyl monomer and a copolymerizable unsaturated monomer that can be copolymerized with the aromatic vinyl monomer.

8. (amended)        **The [A]** polyacetal resin composition according to Claim 3, wherein the polymer compound (II) is a polystyrene-based polymer compound comprising a block (a) comprising a styrene monomer and a block (b) comprising isoprene or isoprene-butadiene and containing 20 mol.% or more of vinyl bonds.

11. (amended)        **The [A]** polyacetal resin composition[, which comprises a polyacetal resin composition] according to [any one of Claims 3 to 10,] **Claim 3, further comprising [and] 0.01 to 0.2 parts by weight of at least two of difatty acid calciums having 12-22 carbon atoms [and/or 0.01 to 0.9 parts by weight of at least two of esters of a fatty acid having 12-22 carbon atoms with ethylene glycol].**

12. (amended)        A molding comprising an ABA type block copolymer according to **Claim 1 [Claims 1 or 2, or a resin composition according to any one of Claims 3 to 11].**

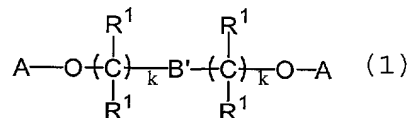
13. (amended)        **The [A]** molding according to Claim 12, wherein the molding is a large-diameter gear having a pitch circle diameter of 60 mm or more.

14. (amended)      **The [A]** molding according to Claim 12, wherein the molding is a large-diameter gear having a pitch circle diameter of 100 mm or more.

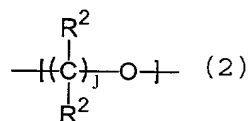
**Appendix B**  
**Complete Set of Pending Claims, March 29, 2001**

Attorney Docket: 5868-024

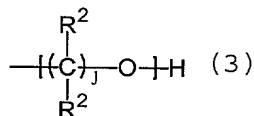
1. An ABA type block copolymer, which comprises polyacetal segments (A) and a hydrogenated polybutadiene segment (B) hydroxyalkylated at both ends, represented by the following formula (1):



[where A comprises 95-99.9 mol.% of oxymethylene units and 0.1-5 mol.% of oxyalkylene units represented by the following formula (2):



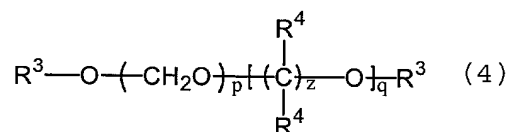
(where R<sup>2</sup> is independently selected from the group consisting of hydrogen, an alkyl group, a substituted alkyl group, an aryl group and a substituted aryl group, and j is an integer selected from 2 to 6), and the terminal groups are polyacetal copolymer residues having a structure represented by the following formula (3):



(where R<sup>2</sup> and j have the same meanings as defined above), B' is a hydrogenated polybutadiene having an iodine value of 20 g - I<sub>2</sub>/100 or less and containing 70-98 mol.% of 1,2-bonds and 2-30 mol.% of 1,4-bonds, R<sup>1</sup> is independently selected from the group consisting of hydrogen, an alkyl group, a substituted alkyl group, an aryl group and a substituted aryl group, and k is an integer selected from 2 to 6 where two ks may be the same or different from each other], the hydrogenated polybutadiene segment (B) hydroxyalkylated at both ends having a number average molecular weight of 500-10,000 and the ABA type block copolymer having a number average molecular weight of 10,000-500,000.

2. The ABA block copolymer according to Claim 1, wherein B' is a hydrogenated polybutadiene containing 80-95 mol.% of 1,2-bonds and 5-20 mol.% of 1,4-bonds.
3. A polyacetal resin composition, which comprises 100 parts by weight of a polymer compound (I) comprising 20-100 wt.% of the ABA type block

copolymer according to Claim 1 and 0-80 wt.% of a polyacetal copolymer having a number average molecular weight of 10,000-500,000, represented by the following formula (4):



(where R<sup>3</sup> and R<sup>4</sup> are independently selected from the group consisting of hydrogen, an alkyl group, a substituted alkyl group, an aryl group and a substituted aryl group, p = 95 - 99.9 mol.%, q = 0.1 - 5 mol.%, p + q = 100 mol.%, and z is an integer selected from 2 to 6), and 0.1 to 200 parts by weight of at least one of polymer compounds (II) having a number average molecular weight of 500 or more, selected from the group consisting of a polyolefin-based polymer compound, a polyurethane-based polymer compound, a polyester-based polymer compound, a polystyrene-based polymer compound, a polyacryl-based polymer compound and a polyamide-based polymer compound.

4. The polyacetal resin composition according to Claim 3, wherein the polymer compound (II) is a polyolefin-based polymer compound comprising  $\alpha$ -olefin-based polymer compound.
5. The polyacetal resin composition according to Claim 4, wherein the  $\alpha$ -olefin-based polymer compound comprises 0.1 to 6 parts by weight of an ethylene- $\alpha$ -olefin random copolymer having a number average molecular weight of 500-10,000, comprising 10-70 mol.% of ethylene units and 30-90 mol.% of  $\alpha$ -olefin units.
6. The polyacetal resin composition according to Claim 4, wherein the  $\alpha$ -olefin-based polymer compound is an  $\alpha$ -olefin-based copolymer modified by an unsaturated carboxylic acid or its acid anhydride.
7. The polyacetal resin composition according to Claim 3, wherein the polymer compound (II) is a polystyrene-based polymer compound comprising a copolymer of an aromatic vinyl monomer and a copolymerizable unsaturated monomer that can be copolymerized with the aromatic vinyl monomer.
8. The polyacetal resin composition according to Claim 3, wherein the polymer compound (II) is a polystyrene-based polymer compound comprising a block (a) comprising a styrene monomer and a block (b) comprising isoprene or isoprene-butadiene and containing 20 mol.% or more of vinyl bonds.
9. A polyacetal resin composition, which comprises 100 parts by weight of a polymer compound (I) and 0.1 to 100 parts by weight of an inorganic filler.

10. A polyacetal resin composition, which comprises 100 parts by weight of polymer compound (I), 1 to 20 parts by weight of polymer compound (II) and 0.1 to 100 parts by weight of an inorganic filler.
11. The polyacetal resin composition according to Claim 3, further comprising 0.01 to 0.2 parts by weight of at least two of difatty acid calciums having 12-22 carbon atoms.
12. A molding comprising an ABA type block copolymer according to Claim 1.
13. The molding according to Claim 12, wherein the molding is a large-diameter gear having a pitch circle diameter of 60 mm or more.
14. The molding according to Claim 12, wherein the molding is a large-diameter gear having a pitch circle diameter of 100 mm or more.
15. The polyacetal resin composition according to Claim 3, further comprising 0.01 to 0.9 parts by weight of at least two of esters of a fatty acid having 12-22 carbon atoms with ethylene glycol.
16. A molding comprising a resin composition according to Claim 3.
17. The molding according to Claim 16, wherein the molding is a large-diameter gear having a pitch circle diameter of 60 mm or more.
18. The molding according to Claim 16, wherein the molding is a large-diameter gear having a pitch circle diameter of 100 mm or more.